

RECEIVED



MAY 10 2002

TECH CENTER 1600/2900

ENTERED

1647

RAW SEQUENCE LISTING

DATE: 05/02/2002 P.6

PATENT APPLICATION: US/09/272,835D

TIME: 16:31:48

Input Set : A:\GENENT.065A103001.txt

Output Set: N:\CRF3\05022002\I272835D.raw

#23

```

4 <110> APPLICANT: De Sauvage, Frederic J.
5 Klein, Richard D.
6 Rosenthal, Arnon
7 Phillips, Heidi S.
9 <120> TITLE OF INVENTION: GFRALPHA3 AND ITS USES
12 <130> FILE REFERENCE: GENENT.065A
14 <140> CURRENT APPLICATION NUMBER: 09/272,835D
15 <141> CURRENT FILING DATE: 1999-03-19
17 <150> PRIOR APPLICATION NUMBER: 60/079,124
18 <151> PRIOR FILING DATE: 1998-03-23
20 <150> PRIOR APPLICATION NUMBER: 60/081,569
21 <151> PRIOR FILING DATE: 1998-04-13
23 <160> NUMBER OF SEQ ID NOS: 25
25 <170> SOFTWARE: FastSEQ for Windows Version 4.0
27 <210> SEQ ID NO: 1
28 <211> LENGTH: 387
29 <212> TYPE: DNA
30 <213> ORGANISM: Mus musculus
32 <400> SEQUENCE: 1
33 ctgatttgca gcctgtggtg ggagagaact cgccagcctg tggaagaaga cgcagcgcgc 60
34 tacacagcaa ccggaacca accaggcatt ccgcagcaca tcccgctctgc tccagaagag 120
35 gtcttagaag tgagggtgtg gacccttccg atcctgagcg gctagttttc aaacctccct 180
36 tgccccctgt tccttctggc tcaggctgct cctccttagg actttgtggg tccagttttg 240
37 ccttctgttc tgatggtgat tagcggtc cctccagcgc ttcttctgt ttcccaggac 300
38 caccagagg ctaaggaatc agtcattccc tgttgccctc tccaggaagg caggctaagg 360
39 gttctgaggt gactgagaaa aatgttt 387
41 <210> SEQ ID NO: 2
42 <211> LENGTH: 353
43 <212> TYPE: DNA
44 <213> ORGANISM: Mus musculus
46 <400> SEQUENCE: 2
47 cgcggcgccc agcagggcag agcgtgtcg catcccgggc gtccaccgc catggggctc 60
48 tcctggagcc cgcgacctcc actgctgatg atcctgctac tgggtgtgtc gttgtggctg 120
49 ccacttgag caggaaactc ccttgccaca gagaacaggt ttgtgaacag ctgtaccag 180
50 gccagaaaga aatgcgaggc taatcccgct tgcaaggctg cctaccagca cctgggctcc 240
51 tgcacctcca gttaagcagg ccgctgccct tagaggagtc tgccatgtct gcagactgcc 300
52 tagaggcagc agaacaactc aggaacagct ctctgataga ctgcagggtgc cat 353
54 <210> SEQ ID NO: 3
55 <211> LENGTH: 498
56 <212> TYPE: DNA
57 <213> ORGANISM: Mus musculus
59 <400> SEQUENCE: 3
60 aattcggaac gaggggtgaag gagcttcgca agtcccaagg ccctttggaa gtcgctgaag 60

```

RAW SEQUENCE LISTING

DATE: 05/02/2002

PATENT APPLICATION: US/09/272,835D

TIME: 16:31:48

Input Set : A:\GENENT.065A103001.txt

Output Set: N:\CRF3\05022002\I272835D.raw

```

61 ctgccgtcag ccaatccagt ggactcgcag ccaaatttgt catccactgt cacatccccc 120
62 agtgggactc cgacaaatgt gaagaacagc tggaagagac catcaaaaac tgcctgtctg 180
63 cagcagagga caagaagctt aaatccgtcg ccttcccacc gttccccagt ggcagaaact 240
64 gcttccccaa acagacggcc gcccagggtga ccctcaaggc catctcggct cacttcgcag 300
65 actcgagctc gtcctcgtcg aagaatgtgt acttcctgct cttcgacagc gagacatcgg 360
66 catctacgtg caggagatgg ccaaactgga caccaagtag ctctctccag tggcggcgaa 420
67 ggaggaggat cggcgtgacg tcacaagagc ggggggttta ttttttacia ggattgcaga 480
68 aggggtgacgg ggcattggg                                     498
70 <210> SEQ ID NO: 4
71 <211> LENGTH: 1935
72 <212> TYPE: DNA
73 <213> ORGANISM: Mus musculus
75 <400> SEQUENCE: 4
76 gaatttggcc ctgcaggcca agaattcggc acgaggcgcg gcgcccagcg caggcagagc 60
77 gctgtcgcac cccgggcgtc caccgcacat ggggctctcc tggagcccg caccctccact 120
78 gctgatgata ctgctactgg tgctgtcgtt gtggctgcca cttggagcag gaaactccct 180
79 tgccacagag aacagggtttg tgaacagctg taccagggcc agaaagaaat gcgaggctaa 240
80 tcccgcttgc aaggctgcct accagcacct gggctcctgc acctccagtt taagcaggcc 300
81 gctgccctta gaggagtctg ccattgtctg agactgccta gaggcagcag aacaactcag 360
82 gaacagctct ctgatagact gcagggtgcca tcggcgcatg aagcaccag ctacctgtct 420
83 ggacatttat tggaccgttc accctgcccg aagccttggg gactacgagt tggatgtctc 480
84 accctatgaa gacacagtga ccagcaaacc ctggaaaatg aatcttagca agttgaacat 540
85 gctcaaacca gactcggacc tctgcctcaa atttgctatg ctgtgtactc ttcacgacaa 600
86 gtgtgaccgc ctgcgcgaag cctacgggga ggcattgctc gggatccgct gccagcgcca 660
87 cctctgccta gccacgtctg gctccttctt tgagaaggca gcagagtccc acgctcaggg 720
88 tctgtctgtg tgtccctgtg caccagaaga tgcgggctgt ggggagcggc ggcgtaacac 780
89 catcgcccc agttgcgccc tgccttctgt aacccccaat tgcctggatc tgcggagctt 840
90 ctgccgtgcg gaccctttgt gcagatcacg cctgatggac ttccagaccc actgtcatcc 900
91 tatggacatc cttgggactt gtgcaactga gcagtccaga tgtctgcggg catacctggg 960
92 gctgattggg actgccatga cccaaactt catcagcaag gtcaacacta ctgttgctt 1020
93 aagctgcacc tgcgcaggca gcggcaacct acaggacgag tgtgaacagc tggaaaggtc 1080
94 cttctcccag aacccctgcc tcgtggaggc cattgcagct aagatgcgtt tccacagaca 1140
95 gctcttctcc caggactggg cagactctac tttttcagtg gtgcagcagc agaacagcaa 1200
96 cctgtctctg agactgcagc ccaggctacc cattctttct ttctccatcc ttcccttgat 1260
97 tctgtctcag accctctggt agctgggctt cctcagggtc ctttgtcctc tccaccacac 1320
98 ccagactgat ttgcagcctg tgggtgggaga gaactcgcca gcctgtggaa gaagacgcag 1380
99 cgtgtctaac agcaacccgg aaccaaccag gcattccgca gcacatcccg tctgtctccag 1440
100 aagagggtctt agaagtgagg gctgtgaccc ttccgatcct gagcggctag ttttcaaacc 1500
101 tcccttgccc ctgcttccct ctggtcagc ctgctcctcc ttaggacttt gtgggtccag 1560
102 ttttgccctc tgtttctgat gtgattagcg gctcacctcc agcgttctt cctgtttccc 1620
103 aggaccaccc agaggctaa gaaatcagtc ttccctgttg ccttctccag gaaggcaggc 1680
104 taagggttct gagggtgact agaaaaatgt ttcccttctg tggaaaggct gtgtccagc 1740
105 ctccacgtcc ctctgaatgg aagataaaaa cctgtctggt tcttgactgc tctgccaggc 1800
106 aatcctgaac atttgggcat gaagagctaa agtctttggg tcttgtttaa ctccattac 1860
107 tgtccccaaa ttcccttagt cccttgggtc atgattaaac attttgactt aaaaaaaaaa 1920
108 aaaaaaaaaa aaaaa                                     1935
110 <210> SEQ ID NO: 5
111 <211> LENGTH: 397
112 <212> TYPE: PRT

```

RAW SEQUENCE LISTING

DATE: 05/02/2002

PATENT APPLICATION: US/09/272,835D

TIME: 16:31:48

Input Set : A:\GENENT.065A103001.txt

Output Set: N:\CRF3\05022002\I272835D.raw

```

113 <213> ORGANISM: Mus musculus
115 <400> SEQUENCE: 5
116 Met Gly Leu Ser Trp Ser Pro Arg Pro Pro Leu Leu Met Ile Leu Leu
117 1 5 10 15
118 Leu Val Leu Ser Leu Trp Leu Pro Leu Gly Ala Gly Asn Ser Leu Ala
119 20 25 30
120 Thr Glu Asn Arg Phe Val Asn Ser Cys Thr Gln Ala Arg Lys Lys Cys
121 35 40 45
122 Glu Ala Asn Pro Ala Cys Lys Ala Ala Tyr Gln His Leu Gly Ser Cys
123 50 55 60
124 Thr Ser Ser Leu Ser Arg Pro Leu Pro Leu Glu Glu Ser Ala Met Ser
125 65 70 75 80
126 Ala Asp Cys Leu Glu Ala Ala Glu Gln Leu Arg Asn Ser Ser Leu Ile
127 85 90 95
128 Asp Cys Arg Cys His Arg Arg Met Lys His Gln Ala Thr Cys Leu Asp
129 100 105 110
130 Ile Tyr Trp Thr Val His Pro Ala Arg Ser Leu Gly Asp Tyr Glu Leu
131 115 120 125
132 Asp Val Ser Pro Tyr Glu Asp Thr Val Thr Ser Lys Pro Trp Lys Met
133 130 135 140
134 Asn Leu Ser Lys Leu Asn Met Leu Lys Pro Asp Ser Asp Leu Cys Leu
135 145 150 155 160
136 Lys Phe Ala Met Leu Cys Thr Leu His Asp Lys Cys Asp Arg Leu Arg
137 165 170 175
138 Lys Ala Tyr Gly Glu Ala Cys Ser Gly Ile Arg Cys Gln Arg His Leu
139 180 185 190
140 Cys Leu Ala Gln Leu Arg Ser Phe Phe Glu Lys Ala Ala Glu Ser His
141 195 200 205
142 Ala Gln Gly Leu Leu Leu Cys Pro Cys Ala Pro Glu Asp Ala Gly Cys
143 210 215 220
144 Gly Glu Arg Arg Arg Asn Thr Ile Ala Pro Ser Cys Ala Leu Pro Ser
145 225 230 235 240
146 Val Thr Pro Asn Cys Leu Asp Leu Arg Ser Phe Cys Arg Ala Asp Pro
147 245 250 255
148 Leu Cys Arg Ser Arg Leu Met Asp Phe Gln Thr His Cys His Pro Met
149 260 265 270
150 Asp Ile Leu Gly Thr Cys Ala Thr Glu Gln Ser Arg Cys Leu Arg Ala
151 275 280 285
152 Tyr Leu Gly Leu Ile Gly Thr Ala Met Thr Pro Asn Phe Ile Ser Lys
153 290 295 300
154 Val Asn Thr Thr Val Ala Leu Ser Cys Thr Cys Arg Gly Ser Gly Asn
155 305 310 315 320
156 Leu Gln Asp Glu Cys Glu Gln Leu Glu Arg Ser Phe Ser Gln Asn Pro
157 325 330 335
158 Cys Leu Val Glu Ala Ile Ala Ala Lys Met Arg Phe His Arg Gln Leu
159 340 345 350
160 Phe Ser Gln Asp Trp Ala Asp Ser Thr Phe Ser Val Val Gln Gln Gln
161 355 360 365
162 Asn Ser Asn Pro Ala Leu Arg Leu Gln Pro Arg Leu Pro Ile Leu Ser

```

RAW SEQUENCE LISTING

DATE: 05/02/2002

PATENT APPLICATION: US/09/272,835D

TIME: 16:31:48

Input Set : A:\GENENT.065A103001.txt ,

Output Set: N:\CRF3\05022002\I272835D.raw

```

163      370      375      380
164 Phe Ser Ile Leu Pro Leu Ile Leu Leu Gln Thr Leu Trp
165 385      390      395
168 <210> SEQ ID NO: 6
169 <211> LENGTH: 460
170 <212> TYPE: PRT
171 <213> ORGANISM: Homo sapiens
173 <400> SEQUENCE: 6
174 Met Phe Leu Ala Thr Leu Tyr Phe Ala Leu Pro Leu Leu Asp Leu Leu
175 1      5      10      15
176 Leu Ser Ala Glu Val Ser Gly Gly Asp Arg Leu Asp Cys Val Lys Ala
177      20      25      30
178 Ser Asp Gln Cys Leu Lys Glu Gln Ser Cys Ser Thr Lys Tyr Arg Thr
179      35      40      45
180 Leu Arg Gln Cys Val Ala Gly Lys Glu Thr Asn Phe Ser Leu Ala Ser
181      50      55      60
182 Gly Leu Glu Ala Lys Asp Glu Cys Arg Ser Ala Met Glu Ala Leu Lys
183 65      70      75      80
184 Gln Lys Ser Leu Tyr Asn Cys Arg Cys Lys Arg Gly Met Lys Lys Glu
185      85      90      95
186 Lys Asn Cys Leu Arg Ile Tyr Trp Ser Met Tyr Gln Ser Leu Gln Gly
187      100     105     110
188 Asn Asp Leu Leu Glu Asp Ser Pro Tyr Glu Pro Val Asn Ser Arg Leu
189      115     120     125
190 Ser Asp Ile Phe Arg Val Val Pro Phe Ile Ser Val Glu His Ile Pro
191      130     135     140
192 Lys Gly Asn Asn Cys Leu Asp Ala Ala Lys Ala Cys Asn Leu Asp Asp
193 145     150     155     160
194 Ile Cys Lys Lys Tyr Arg Ser Ala Tyr Ile Thr Pro Cys Thr Thr Ser
195      165     170     175
196 Val Ser Asn Asp Val Cys Asn Arg Arg Lys Cys His Lys Ala Leu Arg
197      180     185     190
198 Gln Phe Phe Asp Lys Val Pro Ala Lys His Ser Tyr Gly Met Leu Phe
199      195     200     205
200 Cys Ser Cys Arg Asp Ile Ala Cys Thr Glu Arg Arg Arg Gln Thr Ile
201      210     215     220
202 Val Pro Val Cys Ser Tyr Glu Glu Arg Glu Lys Pro Asn Cys Leu Asn
203 225     230     235     240
204 Leu Gln Asp Ser Cys Lys Thr Asn Tyr Ile Cys Arg Ser Arg Leu Ala
205      245     250     255
206 Asp Phe Phe Thr Asn Cys Gln Pro Glu Ser Arg Ser Val Ser Ser Cys
207      260     265     270
208 Leu Lys Glu Asn Tyr Ala Asp Cys Leu Leu Ala Tyr Ser Gly Leu Ile
209      275     280     285
210 Gly Thr Val Met Thr Pro Asn Tyr Ile Asp Ser Ser Ser Leu Ser Val
211      290     295     300
212 Ala Pro Trp Cys Asp Cys Ser Asn Ser Gly Asn Asp Leu Glu Glu Cys
213 305     310     315     320
214 Leu Lys Phe Leu Asn Phe Phe Lys Asp Asn Thr Cys Leu Lys Asn Ala

```

RAW SEQUENCE LISTING

DATE: 05/02/2002

PATENT APPLICATION: US/09/272,835D

TIME: 16:31:48

Input Set : A:\GENENT.065A103001.txt

Output Set: N:\CRF3\05022002\I272835D.raw

```

215          325          330          335
216 Ile Gln Ala Phe Gly Asn Gly Ser Asp Val Thr Val Trp Gln Pro Ala
217          340          345          350
218 Phe Pro Val Gln Thr Thr Thr Ala Thr Thr Thr Thr Ala Leu Arg Val
219          355          360          365
220 Lys Asn Lys Pro Leu Gly Pro Ala Gly Ser Glu Asn Glu Ile Pro Thr
221          370          375          380
222 His Val Leu Pro Pro Cys Ala Asn Leu Gln Ala Gln Lys Leu Lys Ser
223 385          390          395          400
224 Asn Val Ser Gly Asn Thr His Leu Cys Ile Ser Asn Gly Asn Tyr Glu
225          405          410          415
226 Lys Glu Gly Leu Gly Ala Ser Ser His Ile Thr Thr Lys Ser Met Ala
227          420          425          430
228 Ala Pro Pro Ser Cys Gly Leu Ser Pro Leu Leu Val Leu Val Val Thr
229          435          440          445
230 Ala Leu Ser Thr Leu Leu Ser Leu Thr Glu Thr Ser
231          450          455          460
234 <210> SEQ ID NO: 7
235 <211> LENGTH: 464
236 <212> TYPE: PRT
237 <213> ORGANISM: Homo sapiens
239 <400> SEQUENCE: 7
240 Met Ile Leu Ala Asn Val Phe Phe Leu Phe Phe Phe Leu Asp Glu Thr
241 1          5          10          15
242 Leu Arg Ser Leu Ala Ser Pro Ser Ser Leu Gln Asp Pro Glu Leu His
243          20          25          30
244 Gly Trp Arg Pro Pro Val Asp Cys Val Arg Ala Asn Glu Leu Cys Ala
245          35          40          45
246 Ala Glu Ser Asn Cys Ser Ser Arg Tyr Arg Thr Leu Arg Gln Cys Leu
247          50          55          60
248 Ala Gly Arg Asp Arg Asn Thr Met Leu Ala Asn Lys Glu Cys Gln Ala
249 65          70          75          80
250 Ala Leu Glu Val Leu Gln Glu Ser Pro Leu Tyr Asp Cys Arg Cys Lys
251          85          90          95
252 Arg Gly Met Lys Lys Glu Leu Gln Cys Leu Gln Ile Tyr Trp Ser Ile
253          100          105          110
254 His Leu Gly Leu Thr Glu Gly Glu Glu Phe Tyr Glu Ala Ser Pro Tyr
255          115          120          125
256 Glu Pro Val Thr Ser Arg Leu Ser Asp Ile Phe Arg Leu Ala Ser Ile
257          130          135          140
258 Phe Ser Gly Thr Gly Ala Asp Pro Val Val Ser Ala Lys Ser Asn His
259 145          150          155          160
260 Cys Leu Asp Ala Ala Lys Ala Cys Asn Leu Asn Asp Asn Cys Lys Lys
261          165          170          175
262 Leu Arg Ser Ser Tyr Ile Ser Ile Cys Asn Arg Glu Ile Ser Pro Thr
263          180          185          190
264 Glu Arg Cys Asn Arg Arg Lys Cys His Lys Ala Leu Arg Gln Phe Phe
265          195          200          205
266 Asp Arg Val Pro Ser Glu Tyr Thr Tyr Arg Met Leu Phe Cys Ser Cys

```

RAW SEQUENCE LISTING ERROR SUMMARY DATE: 05/02/2002
PATENT APPLICATION: US/09/272,835D TIME: 16:31:49

Input Set : A:\GENENT.065A103001.txt
Output Set: N:\CRF3\05022002\I272835D.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:10; N Pos. 7,8,11,13,15,17,19,78,152,153,154,155,156,157,158,159,160
Seq#:10; N Pos. 161,162,163,164,165,166,167,168,169,170,171,172,173,174,175
Seq#:10; N Pos. 176,177,178,179,180,181,182,183,184,185,186,187,188

VERIFICATION SUMMARY

DATE: 05/02/2002

PATENT APPLICATION: US/09/272,835D

TIME: 16:31:49

Input Set : A:\GENENT.065A103001.txt

Output Set: N:\CRF3\05022002\I272835D.raw

L:446 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:0
L:447 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:60
L:448 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:120
L:449 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:180